Report on the Detroit Area Pre-College Engineering Program (DAPCEP)
as
Required by Public Act No. 169 of 2003, Sec. 309 (2)
for
2002-2003

(The following information about DAPCEP, as well as data from the Detroit Public Schools and national sources, was pr ovided to the Michigan Department of Labor and Economic Growth (DLEG) directly by the DAPCEP staff.)

Background

The Detroit Area Pre-College Engineering Program (DAPCEP) is a pre-college engineering, science and technology initiative in metropolitan Detroit. DAPCEP is dedicated to increasing the number of historically under-represented minority students (African-American, Hispanic-American and Native-American) who are motivated and academically prepared to pursue careers in engineering, science and mathematics-related fields.

According to the 1998/99 Annual Report, DAPCEP was founded with a $250,000 grant from the Alfred Sloan Foundation in 1976. In its first year of operation (inception) only 250 students were served in three Detroit Public Schools (DPS).

DAPCEP was incorporated in 1983 and since then an 18-person board of directors has governed it. Based on the records provided, DAPCEP has experienced phenomenal growth since inception, reaching 6,000+ students in 2001-2002 by combining the resources of a large and active parent group, schools, colleges and universities, and corporations.

The STATE OF MICHIGAN provided $534,000 dollars in support of DAPCEP during 2003. In addition to the state support, DAPCEP generated $3,100,074 of resources through corporate contributions, grants, and in-kind contributions.

DAPCEP operates three programs focused on K-12 students and their teachers:

> *In-School:* DAPCEP trains Detroit Public School (DPS) teachers to present the DAPCEP curriculum, which includes Internet training, science fair projects, multi-cultural projects, field trips, corporate and university seminars, mentors and hands-on experiments for Detroit area students.
>
> *Saturday Enrichment:* Colleges, universities and corporations conduct several diverse pro grams in the area of mathematics, computer science, engineering, physics, chemistry, and communications skill for students.
>
> *Summer Enrichment:* Several Michigan universities offer on-campus enrichment programs in computer science, mathematics, science, engineering and communications. Each summer students participate in these residential and computer programs.

Entrance into DAPCEP programs is competitive. Students are selected based on grades (C+ average or better), interest in learning about DAPCEP, and go od attendance. A Program Committee screens the applications and selects students for participation.

Current Status

In-School Program: In 2002-2003, 44 middle and 21 high schools participated in the In-School program. Students self-select the In-School program with more than 1,570 students participating. In-school classes are primarily offered in middle and high schools that are part of the DPS. In support of the program, a total of 50 teachers received training and updates on the DAPCEP curriculum in 2002. In January of 2003, 19 new and veteran DAPCEP teachers participated in a half-day Science Fair In-Service at the University of Detroit Mercy. In addition, 10 teachers new to the DAPCEP program were trained in the summer of 2003, to help expand the program's capacity to reach more students.

Saturday Enrichment: 2,484 K-12 students participated in the Fall 2002 program and 2,060 K-12 students participated in the Spring 2003 program, including 90 students in the K-3 program in each class. During 2002-2003 a third grade curriculum was piloted with the rising third grade class. Third-grade classes were held at the New Detroit Science Center. Ninety percent of participating parents of K-3 students attended all parent training sessions. The Fall 2002 program could not accommodate over 791 applicants due to the limited number of openings allowable under current funding resources.

Summer Enrichment: The summer program enrolled 222 students. This number included 32 students in the rising 3rd grade pilot program. These pilot program 3rd graders were recommended through 10 partnering DPS schools. The summer program had 825 applicants for 225 openings, and could not accommodate this large number of applicants due to the limited openings imposed by available resources.

Funding Sources & Amounts

DAPCEP reports the following sources and amounts of support for 2002-2003:

Funding Sources	Amounts
Grants:	
➢ **STATE OF MICHIGAN** (Fiscal 2002-2003, 10/01/02 – 9/30/03) (Grant was reduced from original allocation twice in FY 03)	**$534,000**
➢ Neighborhood Opportunity Fund	$129,319
➢ Detroit Public Schools, National Science Foundation	$185,726
Contributions	$972,225
In-Kind Contributions	
➢ Detroit Public Schools	$1,429,710
➢ Other	$361,248
Interest Income	$10,043
Other Revenue	$11,803
Total funding sources and amounts	**$3,634,174**

Dropout Rates: The most recent (1998) data indicates that the DAPCEP dropout rate was 2% compared to the overall DPS dropout rate of 17.92%.

Grade Point Averages (GPA): A comparison of student GPA's for of all DPS schools and DAPCEP Saturday and Summer program enrollment for 2002-2003 is as follows:

	Middle School	High School
Overall GPA for DAPCEP Saturday and Summer Programs	**3.13**	**3.07**
Overall GPA for All DPS Schools	**2.2**	**1.9**

This comparison represents the total population of 2002-2003 DAPCEP students who reported attending a DPS school.

DAPCEP and Non-DAPCEP Graduates: 94% of DAPCEP graduates reported being enrolled in post-secondary education since graduation compared with 83% of their non-DAPCEP counterparts. This included enrollment in "a college, university, special school, or training program." 85% of the DAPCEP graduates reported being enrolled in school full time compared to 75% of non-DAPCEP counterparts. 94% of DAPCEP graduates reported themselves as African-American and 70% indicated that they were female. The National Science Foundation (1997) indicates that only 57% of African-American and Hispanic high school graduates enrolled in college in the fall following their graduation.

DAPCEP Graduates in College Programs in Math, Science, and Engineering: 63% of the male and 60% of the female DAPCEP graduates enrolled in college indicated that they were in math/science related programs such as Biology, Chemistry, Computer Engineering, Electrical Engineering, Mechanical Engineering, or Pre-Medicine. The National Science Foundation (1998) indicates that only 33% of white, African-American, Hispanic, and American Indian freshman intended to major in science and engineering fields.

Appendix A contains graphs and charts submitted by DAPCEP

Report on the Grand Rapids Area Pre-College Engineering Program (GRAPCEP)
as
Required by Public Act No. 169 of 2003, Sec. 309 (2)
for
2002-2003

(The following information about GRAPCEP, as well as data from the Grand Rapids Public Schools and national sources was provided to the Michigan Department of Labor and Economic Growth (DLEG) directly by the GRAPCEP staff.)

Background

The Grand Rapids Area Pre-College Engineering Program (GRAPCEP) began in September 1997. It is a regional pre-college engineering program operated by Davenport University at Grand Rapids in partnership with the Grand Rapids Public Schools (GRPS.) The program is intended to meet the need for well-trained engineers and scientists for growing businesses of West Michigan and to increase the number of historically under-represented populations in these career fields. GRAPCEP achieves its mission by forming working partnerships with area schools, businesses and institutions of higher education. Together, these partners work to enhance the teaching and learning of mathematics and science in the target schools in order to enable students to develop the mathematical, scientific, and personal skills needed to succeed in science and engineering careers.

To become participants in the GRAPCEP program students go through a three-phase selection process – application, teacher recommendation, and personal interview. Acceptance criteria include having a 2.60 or better grade point average (GPA), achieving high scores in social and work habits during the last grade marking period, obtaining positive recommendations from two teachers, and successfully completing an individual interview conducted by a team of at least two GRAPCEP staff and teachers. The interview mirrors a job interview.

GRAPCEP operates three programs focused on middle and high school students and their teachers – In-School, Saturday Enrichment, and Summer Enrichment. Plans for 2002-2003 call for adding an elementary school component.

Current Status

The GRAPCEP program targets one middle school and four high schools in the GRPS – Iroquois Middle School and Central, Creston, Ottawa Hills, and Union High Schools. The target schools have a combined enrollment of 5,460 students. Thirty-six GRAPCEP trained teachers provide the program in these schools.

Services to 7th through 12th grade students totaled 10,132 direct contact hours involving in-school classes, competitions and seminars, and summer experiences. The in-school classes were a project-based Tech Prep class and an introduction to computer programming. The competitions and seminars included FIRST Robotics teams from Central, Creston, and Ottawa Hills High Schools, National Engineers Week "Lunch Hour Competitions", "Math Buster", and rocketry teams at Iroquois Middle School and Union High School. The summer enrichment program, in cooperation with Grand Rapids Community College, Michigan Technological University, and Kettering University, provided focused residential experiences for students as well as the opportunity to enroll in post-secondary courses in math and science.

In addition to the above academic services GRAPCEP provided students with career development services that involved company tours, job shadowing, internships, and career fairs.

The 36 GRAPCEP teachers received over 1,700 direct contact hours of professional development services. These development services included curriculum planning, training on student internships and competitions, using information technology in the classroom – spreadsheet usage (Excel), presentation

software (PowerPoint), and web page development, college level workshops on math/science and "New Connections", and rocketry.

Funding Sources & Amounts

GRAPCEP reports the following sources and amounts of support for 2002-2003:

Funding Sources	Amounts
Grants:	
➢ **STATE OF MICHIGAN** (Fiscal 2002-2003, 10/01/02 – 9/30/03)	$365,900
➢ National Institute of Health awarded to partner GVSU	20,010
➢ Improving Teacher Quality awarded to MTU	13,500
➢ EDDI award to support salaries in Malawi, Africa project	41,276
Contributions	
➢ Total company (business/industry) support	$322,175
➢ Total from other colleges	135,900
➢ Total from other grants	73,500
Other Revenue – carry-over from FY 02	$74,776
Total funding sources and amounts	**$897,475**

Dropout Rates: The GRPS uses two measures of retention: a dropout rate and a mobility rate (number of students who leave school before graduating) in reporting student data. The most recent GRPS data for the mobility rate was for the 1997-1998 school year.

	Dropout Rate	Mobility Rate
GRAPCEP Students (Grades 8 through 12)	**.04%**	**0%**
All GRPS Students (Grades 8 through 12)	**2.32%**	**34%**

GPA for GRPS DAPCEP: A comparison of student GPA's for of all GRPS 8th through 12th graders and GRAPCEP 8th through 12th graders is as follows:

	Grade 8	Grade 9	Grade 10	Grade 11	Grade 12
GPA for GRAPCEP Students	**3.46**	**3.52**	**3.30**	**3.28**	**3.04**
GPA for All Students	**2.41**	**1.85**	**2.08**	**1.93**	**2.51**

GRAPCEP and Non-GRAPCEP Students: GRAPCEP's efforts to work with populations under-represented in engineering and science careers are as follows:

	Females	African-American Females	African-American Males	Asian-American Females and Males	Hispanic Females and Males	Native American Females and Males
GRAPCEP	**51.3%**	**26.2%**	**18.6%**	**6.1%**	**9.7%**	**<1.0%**
GRPS	**50.9%**	**22.1%**	**18.3%**	**2.2%**	**17.0%**	**1.4%**

GPA qualifications influence the percentage of students eligible for GRAPCEP participation. GRAPCEP is continuing to encourage students from all minority groups to apply for participation in the progr am.

GRAPCEP Graduates in College Programs in Math, Science, and Engineering: For the 45 GRAPCEP students who graduated in 2003, 97.8% are enrolled in college degree programs. One student is not enrolled in college and 17 students have not yet given GRAPCEP verification of their enrollment). Twenty-five of the 45 (56.8%) are currently enrolled in a college engineering or science program. The high percentage of GRAPCEP students enrolled in engineering and science programs compares very favorably with the 20% of all students who took the ACT test in 2001 and indicated an interest in entering college programs in engineering, science or mathematics.

Appendix B contains graphs and charts submitted by GRAPCEP.

APPENDIX A

DAPCEP GRAPHS AND CHARTS

Reports are attached electronically under the following filenames:

DAPCEP Financial Status to 2003.xls

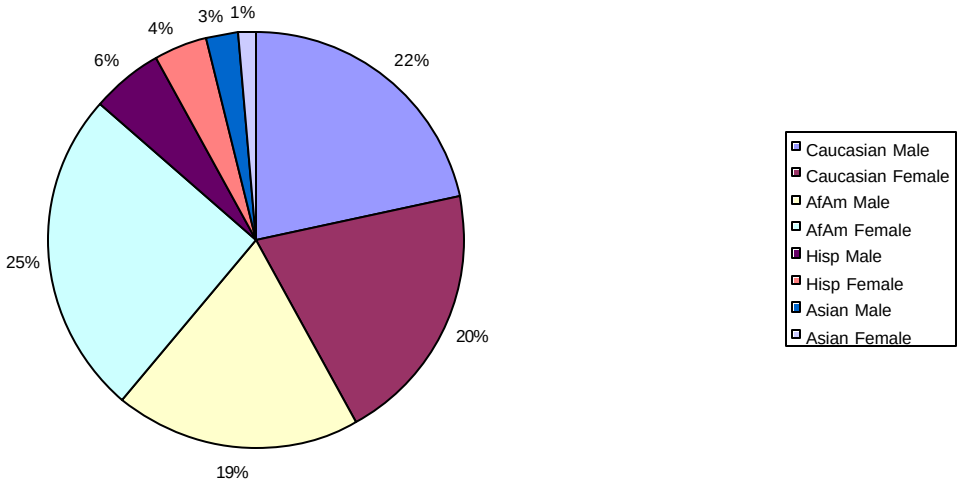
DAPCEP Enrollment 2003.ppt

DAPCEP Scope of Courses 2003.xls

APPENDIX B

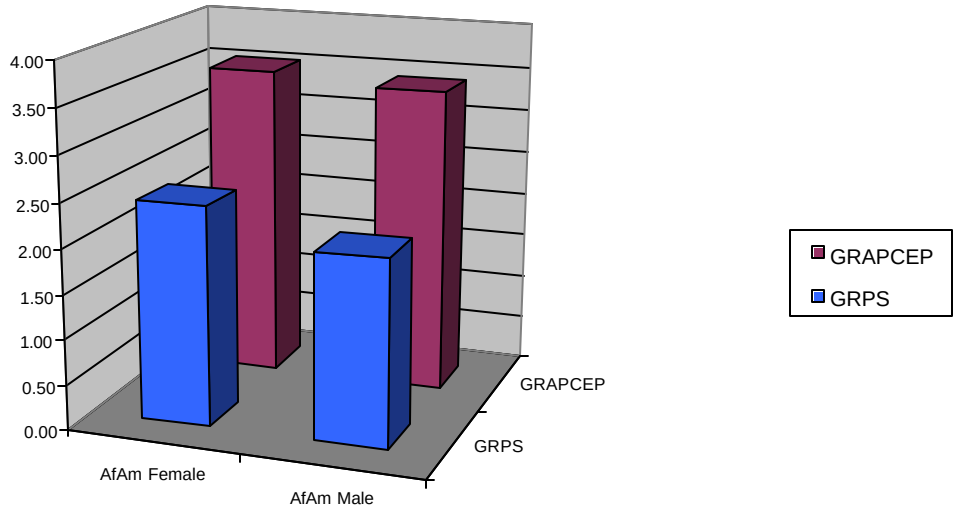
GRAPCEP GRAPHS AND CHARTS

GRPACEP Population 2003



GRAPH 1

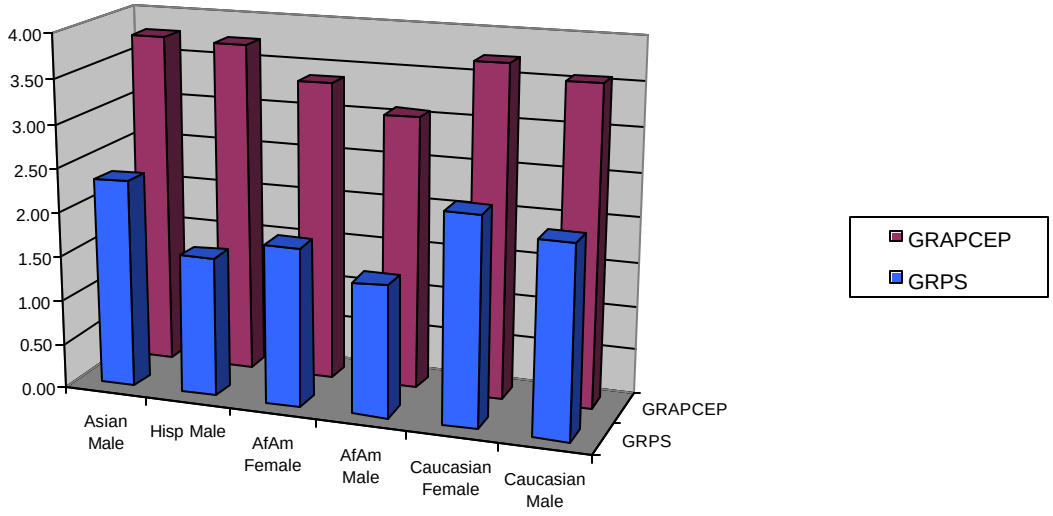
8th Grade GPA Comparison
May 2003



GRAPH 2

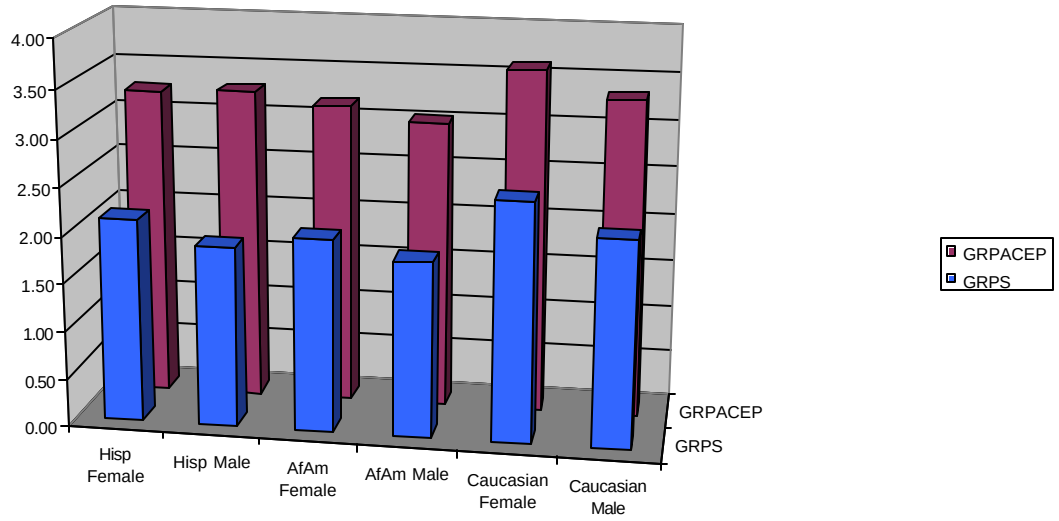
9th Grade GPA Comparison

May 2003



GRAPH 3

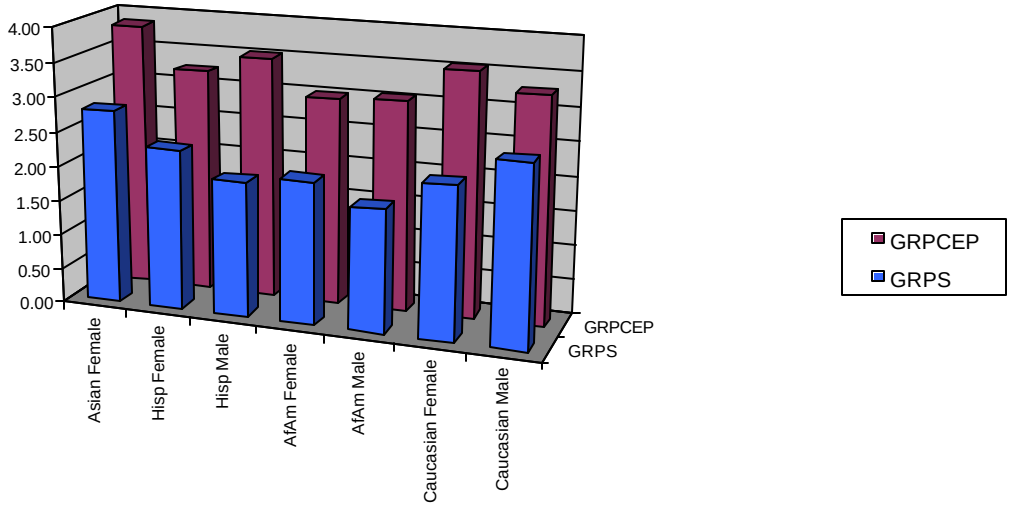
10th Grade GPA Comparison
May 2003



GRAPH 4

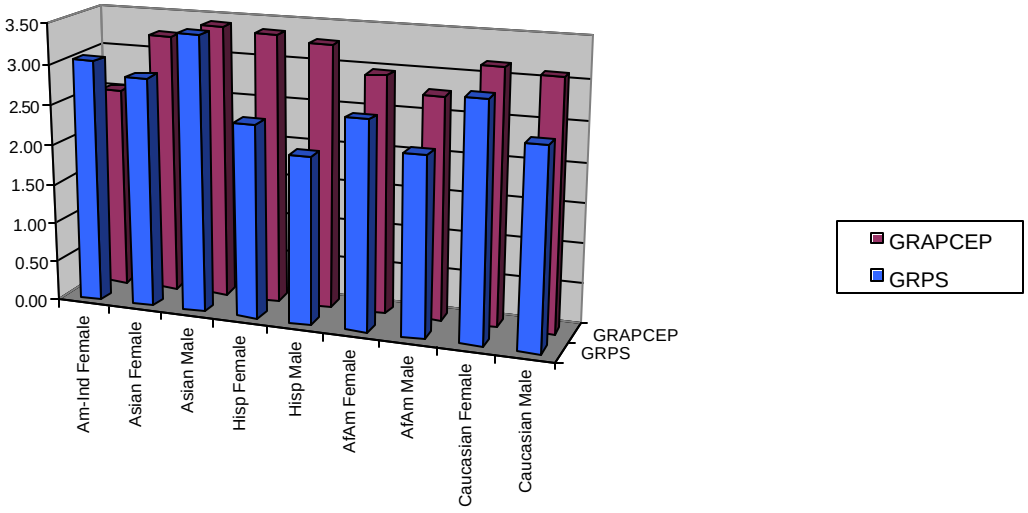
11th Grade GPA Comparison

May 2003



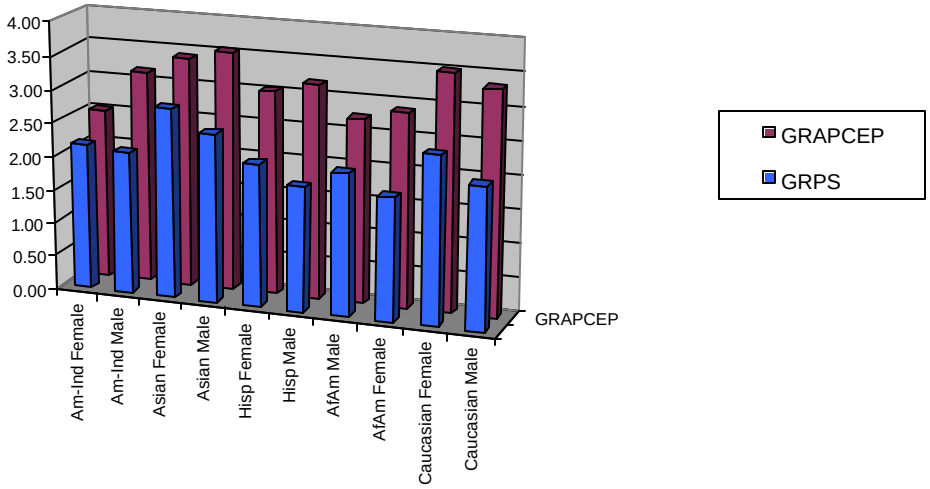
GRAPH 5

12th Grade GPA Comparison
May 2003

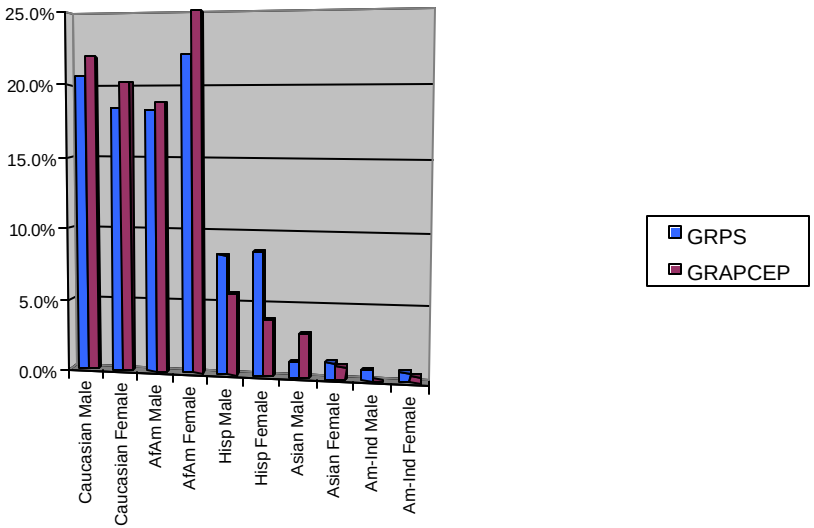


GRAPH 6

Grade Level Combined GPA
for all grades (8th, 9th, 10th, 11th & 12th)
May 2003

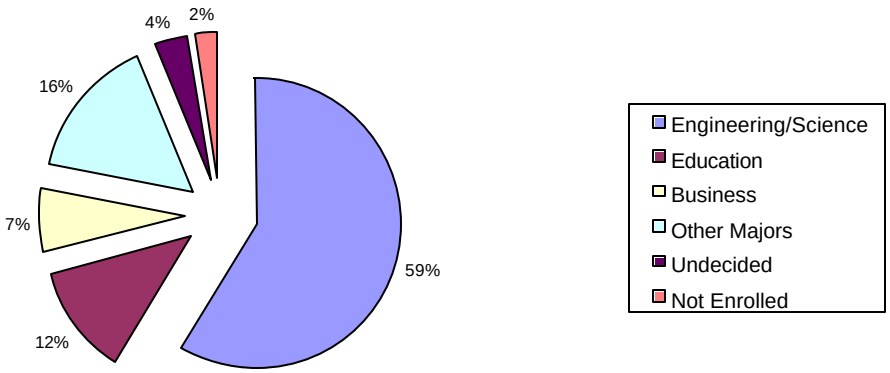


GRAPH 7
Population Comparison
May 2003

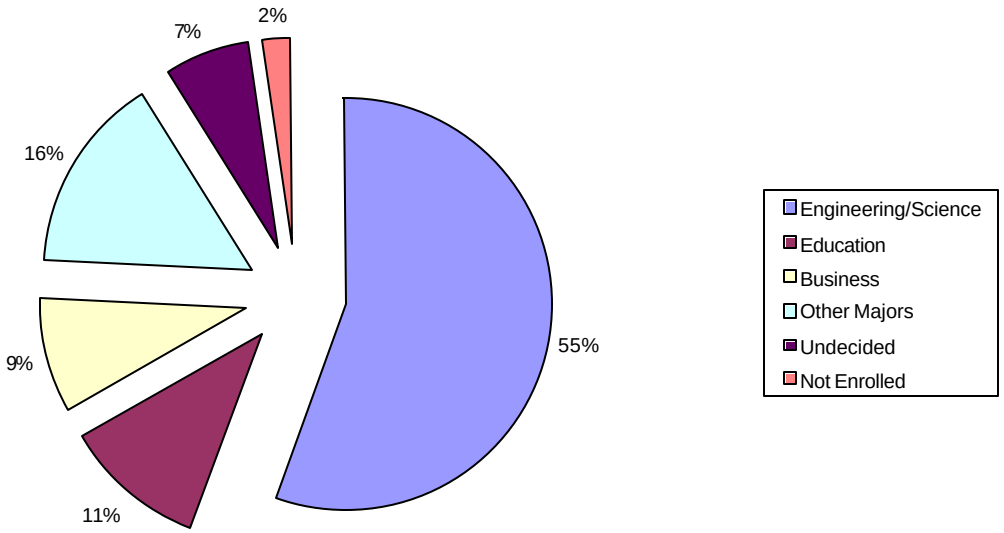


GRAPH 8

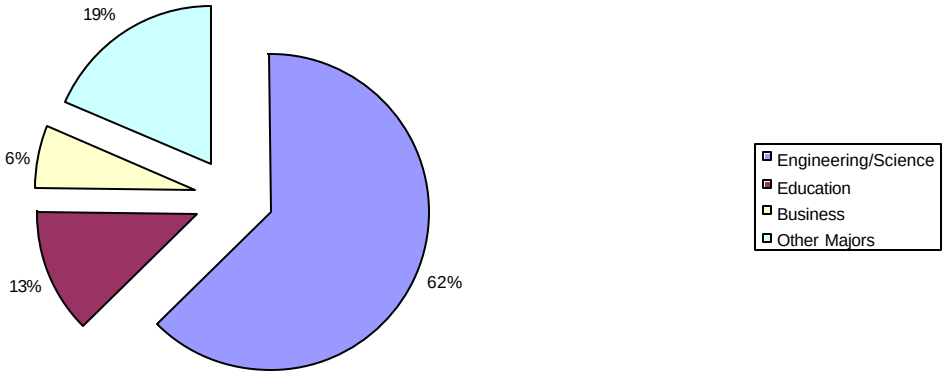
Combined GRAPCEP High Graduate
College Program Enrollment Fall 2003



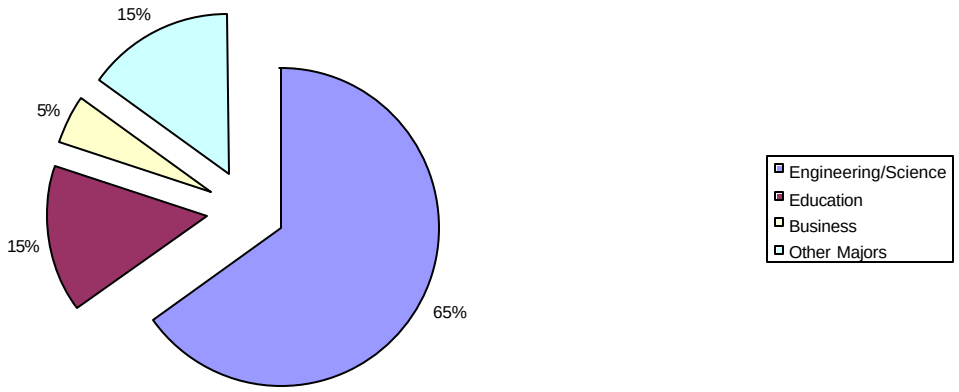
GRAPH
2003 GRAPCEP High School Graduates
College Program Enrollment Fall 2003

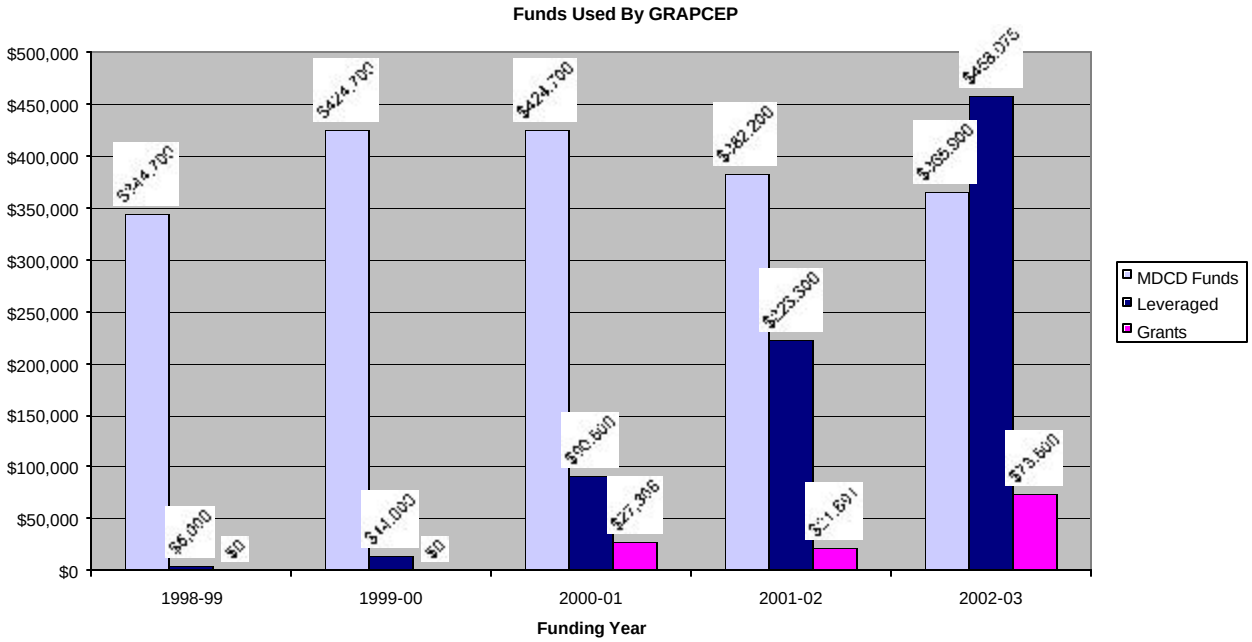


2001 GRAPCEP High School Graduates
College Program Enrollment Fall 2003

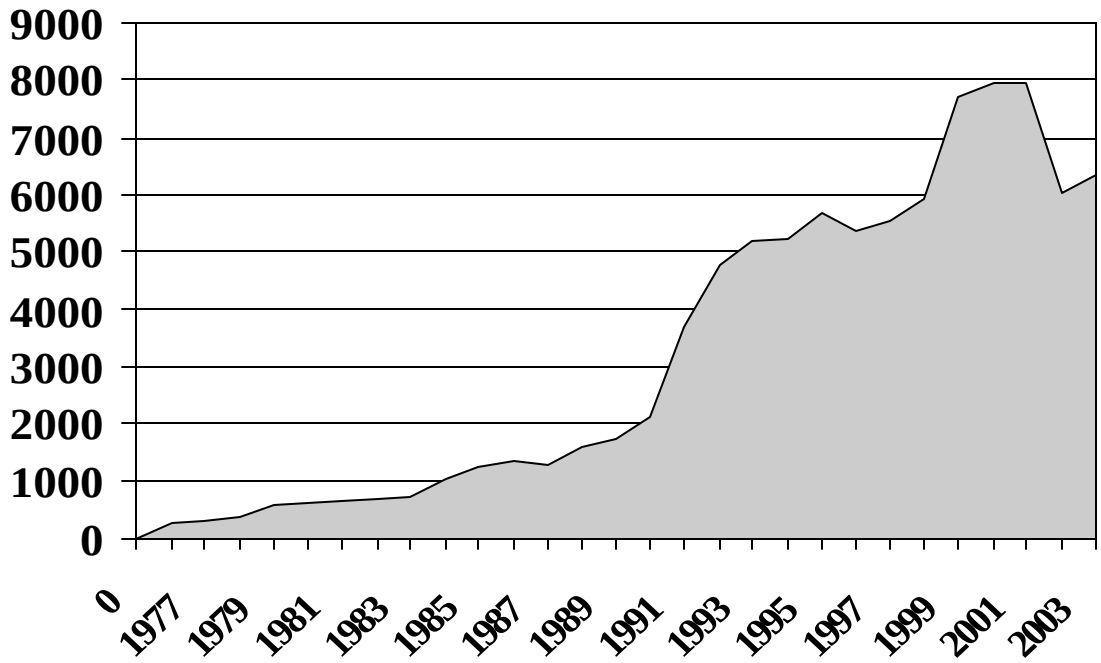


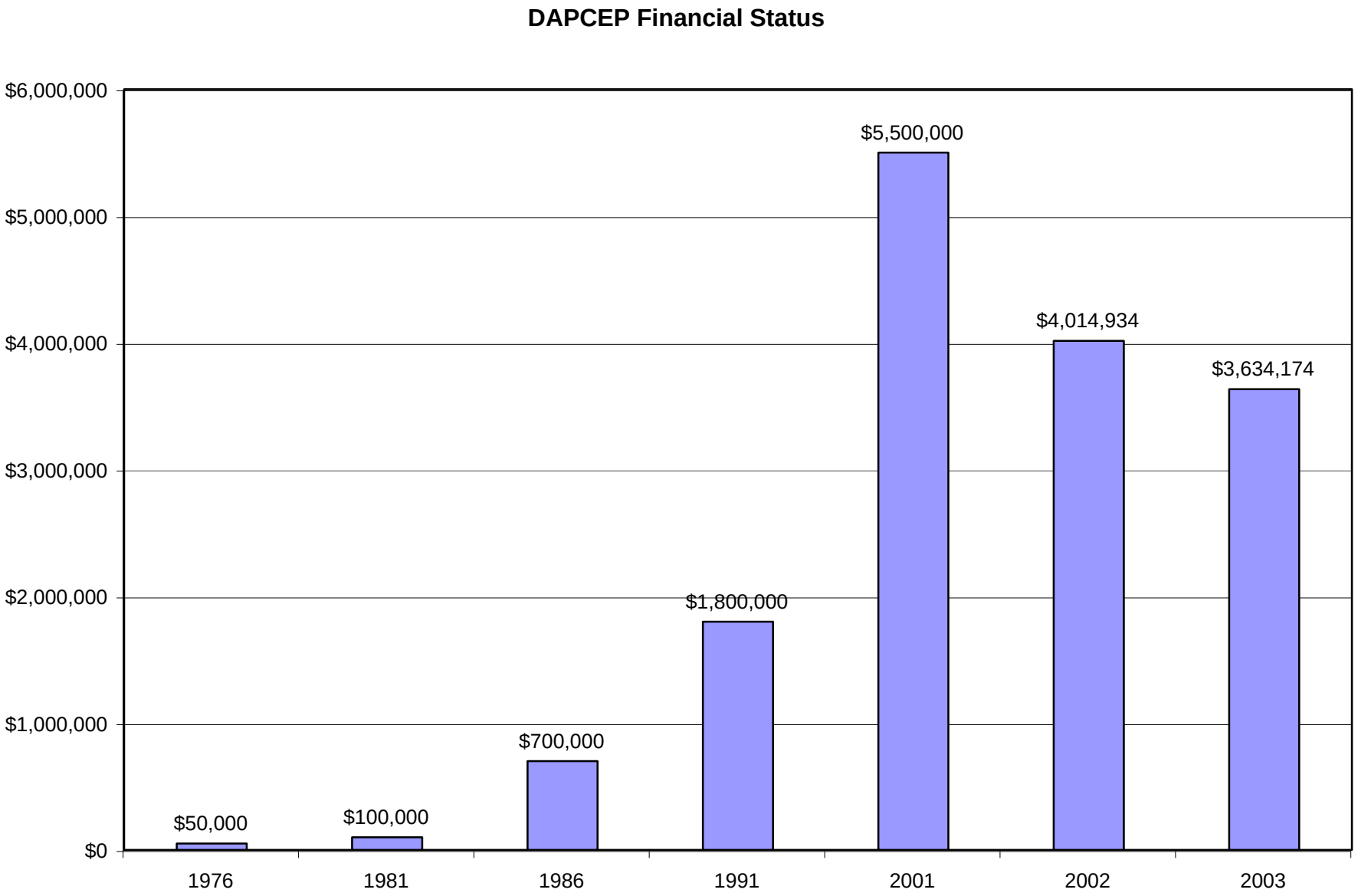
2002 GRAPCEP High School Graduates
College Program Enrollment Fall 2003




Funds Used By GRAPCEP
$500,000
$450,000
$400,000
$350,000
$300,000
$250,000
$200,000
$150,000
$100,000
$50,000
$0
$344,700
$6,000
$0
$424,700
$14,003
$0
$424,700
$90,560
$27,396
$382,200
$223,300
$21,691
$365,900
$458,075
$73,560
1998-99
1999-00
2000-01
2001-02
2002-03
Funding Year
MDCD Funds
Leveraged
Grants

RESULTS – DAPCEP ENROLLMENT




DAPCEP Financial Status
$6,000,000
$5,000,000
$4,000,000
$3,000,000
$2,000,000
$1,000,000
$0
$50,000
$100,000
$700,000
$1,800,000
$5,500,000
$4,014,934
$3,634,174
1976
1981
1986
1991
2001
2002
2003

Scope of DAPCEP Courses

K - 3	
Little Hydrologist	K
Little Chemist	1
Little Mechanical Engineer	2
Little Electrical Engineer	3

Grade 4 - 6	
Everyday Engineering	4
Everyday Engineering	4
Forensic Crime Stoppers - Group 1	4
Forensic Crime Stoppers - Group 2	4
Up, Up and Away - Group 1	5
Up, Up and Away - Group 2	5
World in Motion	5
World in Motion	5
6th Grade Pre-Engineering Math	6
6th Grade Pre-Engineering Math	6
Pre-Engineering Math	6
Pre-Engineering Math	6

Grade 7 - 9	
Automotive IT	7
Creative Engineering	7
Creative Engineering	7
Data Detectives	7
Engineering for the Environment	7
Engineering for the Environment	7
High Fives	7
Learning to Love Engineering through 3-D	7
Statistical Sleuths	7
The Chemical World	8
Introduction to Computer Application	9
Introduction to Computer Applications	9
Line and Curves	9
Becoming Bullish on Technology	7-8
ChemE in Action (Chemical Engineering)	7-8
Computer Programming	7-8
Computer Programming	7-8
Computers and Technology (Electrical Engineering)	7-8
Computers for 7th & 8th Graders	7-8
Fun and Variety in Industrial Operations Engineering	7-8
Glow Blue	7-8
Intermediate Mathematics	7-8
Intermediate Mathematics	7-8
Introduction to Computers I	7-8
Introduction to Computers I	7-8
Introduction to Electrical and Computer Engineering	7-8
Introduction to Electrical and Computer Engineering	7-8
Introduction to Environmental Science and Engineering	7-8
Introduction to Environmental Science and Engineering	7-8
Introduction to Geographic Information Systems	7-8
Learn New Ways of Making Things (Eng'g Research C	7-8
Physics Around Us	7-8
Physics Around Us	7-8
Pirates of Michigan (Naval Architecture Marine Eng'g)	7-8
Planes, Trains and Automobiles (Transportation Resea	7-8
Rockets, Rainbows and Motors	7-8
Rockets, Rainbows and Motors	7-8
Study Smarter, Not Harder	7-8
The Making of the Automobile (Mechanical Engineerin	7-8
What's Inside of Me? (Biomedical Engineering)	7-8
Wonders of Flight (Aerospace Engineering)	7-8
ACT Test Preparation	7-12
Discovery of Life's Processes	8-9
Explorations in Biology	8-9
Science Fiction	8-9
Searching for Life on Mars	8-9
SEP I / SEP II	8-9
UNITE	8-9

Grade 9 - 12	
Computer-Aided Design & Drafting	9-10
Learning Science through Experiments	9-10
Robotics	9-10
Technically Speaking	9-10
Think 3-D Geometry	9-10
Think 3-D Geometry	9-10
Web Page Design	9-10
Windows and Internet Applications Design	9-10
Windows and Internet Applications Design	9-10
Engineering Intensive Workshop	9-11
Ford High School and Science and Technology Program	9-12
Intro. to Automotive Engineering & Leadership Building	9-12
Soft Side of Engineering	9-12
Soft Side of Engineering	9-12
Utilizing GIS to Empower Global Thinkers	9-12
Exam Experts ACT Exam Conquerers	9-12
Academic Intensive Summer Residential Program	10-11
CAD and Engineering Designs	10-11
Civil Engineering	10-11
SEP III / MITE	10-11
The Internet and Web Page Design	10-11
The World of Electrical & Computer Engineering	10-11
Programming in Visual Basic	10-12
Programming with C++	10-12
SAT Preparation	10-12
Seeds of Success	10-12
Wonders of Surface Coating	10-12
Advanced Databases	11-12
CAD CAM	11-12
Engineering Design with Computer Applications	11-12
Engineering Design with Computer Applications	11-12
Introduction to CAD-CAM	11-12
Physics	11-12
Seeds of Success	11-12